# Comanche Acquisition Approach

## Mission Equipment Package — Electronic Heart and Soul of Army's Newest Advanced Technology Helicopter

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The electronic heart and soul of the RAH-66 Comanche advanced technology helicopter is its Mission Equipment Package (MEP). Specifically, MEP includes the mission computers, navigation subsystem, communications subsystem, targeting subsystem, aircraft survivability subsystem, night pilotage subsystem, controls and displays subsystem, and display generation subsystem.

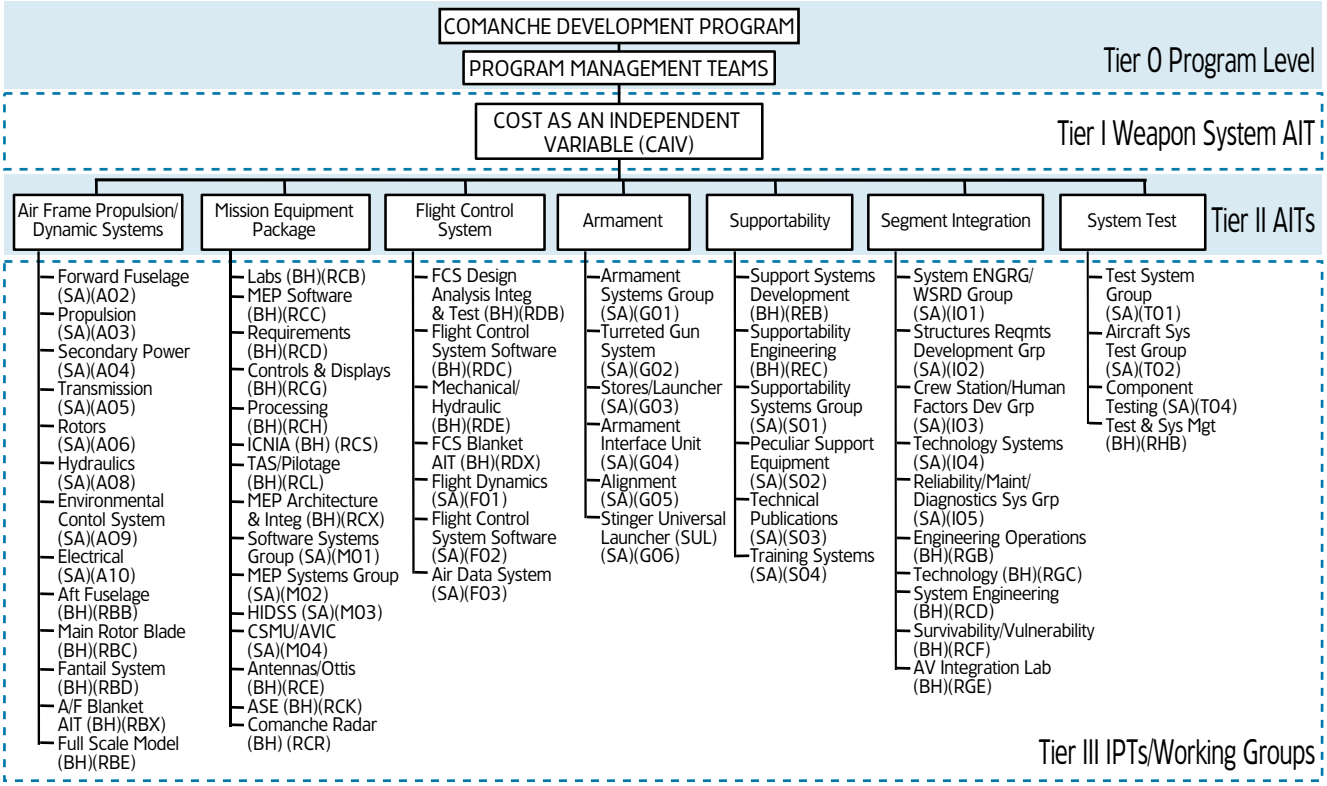
With an impressive suite of advanced electro-optical sensors, digital communication, aided target recognition, sensor/weapons integration, and navigation systems, Comanche brings state-of-the-art information dominance to the maneuver commander.

In the area of interoperability, Comanche's MEP provides the information systems and sensor suites that enable integration of common shared battlefield data horizontally (between battlefield functional areas), maximizing the full value of the combined arms force. Moreover, Comanche's MEP uses an open, flexible electronic system architecture allowing the on-board systems to be tailored for various functional performance levels and is designed to facilitate future growth. A combat system, Comanche far surpasses existing platforms in terms of survivability, versatility, maneuverability, lethality, reliability, and cost of ownership.

### The Challenge

A July 1998 decision redirected the Comanche program to accelerate the Fire Control Radar development by approximately five years; and accelerate entry into the Engineering and Manufacturing Development (EMD) phase by 18

FIGURE 1. **Comanche AIT/IPT Product Management Structure**

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months. This was to be accomplished within current funding constraints, both within annual funding profiles as well as total dollars.

A substantial portion of the program redirection directly impacted MEP. The Comanche MEP has significant technical complexity and presents challenges in developing multiple, integrated new technologies. Modifying EMD plans to meet funding and schedule constraints through routine acquisition practices would not be effective in the time available, while still assuring an executable program plan. For that reason, Comanche implemented aggressive new processes that involved the entire acquisition team (user, developer, contractors, and contracting authorities).

The variety and complexity of the Comanche MEP subsystems and the associated contractor teams provided unique challenges to "fit" the pieces within the cost and schedule constraints, yet optimize performance. Whereas the classic approach would follow the path of Requirements Development – Request for Proposal – Proposal Preparation – Negotiation – Award – Program Planning – IBR/Execution, Comanche was forced to develop a much more aggressive path. The Comanche process literally substituted the classic Proposal Development/Negotiation process with a Program Baseline Planning process, typically implemented after a formal contract is in place.

Predictably, this implementation met with a measure of skepticism from all areas, not the least of which was the contractor community. Although initially viewed as standard Alpha contracting, the Comanche approach went several steps further.

The process required the Acquisition Team to evolve true baseline plans that integrated technical requirements, cost, and schedule into an Integrated Baseline that went beyond the classic "proposal estimating" to "execution estimating." As such, evaluations of the planning in terms of Scope/Requirements vs. planned schedules and resources were possible in greater detail than data typically available as part of an EMD proposal. This proved true even through Alpha contracting.

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The planning to support an Integrated Baseline Review (IBR) became the basis of the "contractors' proposal," and the evaluation and acceptance constituted the "negotiation." As a result, the Comanche approach captured several unique program advantages:

- Seamless program plan to transition from Demonstration/Validation to EMD without typical administrative delays.
- Clear understanding of work scope "included and excluded" in the program to be executed, thereby minimizing downstream surprises.
- Executable plan from Day 1.
- Clear understanding of program risks and assurance that risks were balanced within program elements.
- Substantial programmatic and technical details to support the Milestone Decision process.
- Significant savings in time and resources since the planning was accomplished one time to serve as the proposal and the execution baseline.

The Comanche program had a number of unique attributes that affected, both positively and negatively, the ability to implement such an aggressive strategy.

### Sole Source Contractor

Naming Joint Venture as the prime contractor, with Boeing and Sikorsky as co-primes, resulted in both positive and negative aspects of program management. Assuring the best corporate expertise was applied throughout the scope of activities, while simultaneously maintaining appropriate work share between the two co-primes, became an ongoing challenge. However, without the sole source environment, the aggressive planning and negotiation process would not have been possible.

### Program Acquisition Strategy Redirection (July 1998)

The requirement to significantly accelerate portions of the program and make available production representative aircraft at the point of Independent Operational Test and Evaluation (IOTE), all within established (reduced) schedule and cost constraints, created an environment with incentives and urgency for other than a "business as usual" approach by the acquisition community. However, it became increasingly evident that different elements of the acquisition community react very differently to any perceived "change" in the established processes and procedures.

## Program Organization

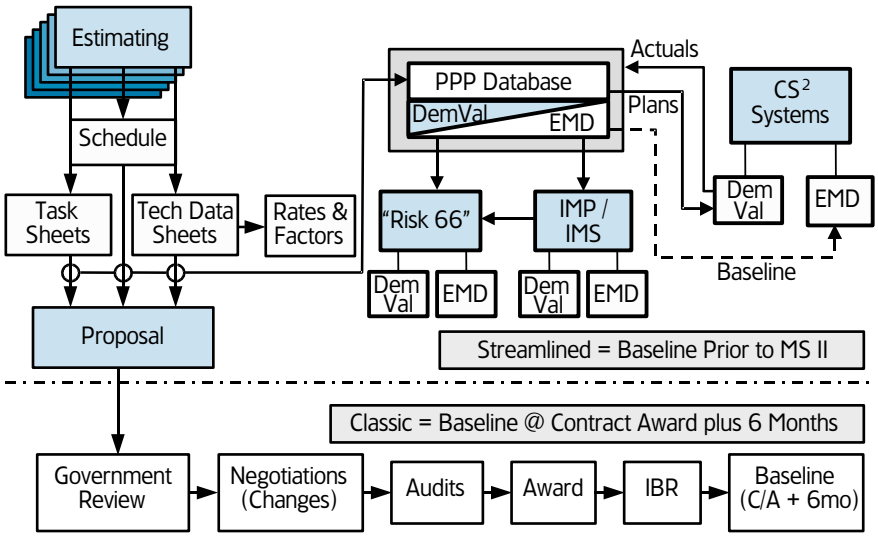
The implementation of a hierarchy of Integrated Product Teams (IPT), established to manage their portions of the program within both the government and contractor teams, provided the basis for allocating responsibility and accountability for each aspect of the program. This became critically important when accomplishing the necessary programmatic and technical trade-offs necessary to "fit" the program within the technical, schedule, and resource constraints. Ultimately, the IPT hierarchy gave Comanche the opportunity to conduct necessary trades at lower levels and subsequently integrate to higher levels, assessing the implications at each successor level and adjusting accordingly (Figure 1).

## Revising the Acquisition Process

Comanche began the process of adapting the strategy to the revised requirements by establishing complete program plans and estimates to meet the complete set of requirements from the top down, meaning allocations were made to each program area through the Analysis Integration Teams (AIT). AITs are organizations representing major aspects of the program (e.g. Airframe, MEP, Flight Controls, etc.). Each AIT is further broken into IPTs that are responsible for distinct technical/scope activities.

Initial allocations flowed to the AIT level were evaluated for impacts against previous plans and estimates and were developed for areas that would require trade-offs between requirements, resources, and schedule. Each AIT developed a program plan specifying the necessary technical and programmatic changes needed to meet stated allocations. Since the contractors were totally involved in the process, the basis for estimating and planning the subsequent EMD program was evolving in a real-time mode, which further assured clear understandings of scope and commitments at the working level. Each Comanche IPT organization is directly responsible for specific Work Breakdown Structure (WBS) elements, facilitating documentation and implementation of subsequent plans and schedules into Earned Value Management Systems (EVMS) already being implemented by the contractor teams.

FIGURE 2. **Proposal Streamlining Advantage**




## Balancing Risks

As the results of the re-planning and revised requirements (what could be accomplished) were integrated at higher levels, additional trades were made within the responsibility of each AIT. At each level, we evaluated risks against the overall program and redirected as necessary to assure that balance was maintained. The iterative process continued until each AIT had achieved a program that met overall objectives and was within acceptable risks.

The culmination of the Comanche restructuring process leading up to the Milestone II Review was the conduct of an Integrated Baseline Review (IBR). Each AIT, IPT, and all WBS elements were reviewed for Scope, Time Phased Resources, Schedule, and Program Risk. The planning data supporting the IBR served not only as the contractor proposal, but also the actual data entered into EVMS systems for continued execution of the program.

## Internal Resource Limitations

Although the overall process resulted in a successful Milestone II decision and what is considered an executable program, we encountered shortfalls. Overcoming them through sound planning, estimating, and trade-offs, while simultaneously continuing the necessary technical development, placed a substantial strain on program resources. Those directly knowledgeable and responsible for the ongoing efforts were the same as those necessary to effect trades to develop the restructured program.

The investment in developing the greater-than-normal level of detail caused lower-than-expected contract performance during the preparation and conduct of the milestone decision process. Although this will generate near-term challenges in the schedule execution of EMD, the program office's confidence in, and insight into, the resulting program plans will far exceed the investment and pay substantial dividends throughout program execution.

## Aggressive Program Action vs. Standard Decision Process

Even though the Comanche program was instituting an aggressive government/contractor team process to "fit" the program within defined constraints, it became increasingly apparent that communicating the results of such a dynamic process to the decision makers through their respective staffs, particularly in light of the constant changes taking place, was difficult at best. The rate of change, although part of the process, made it difficult for those not intimately involved to appreciate the overall implications to the program.

Once again, the Comanche's bold and aggressive program strategy proved its worth. The resulting program performance requirements, associated schedules, resource needs, and EMD contract package, collectively developed and refined during this process, represented the revised Comanche Program as presented and approved by the Army and Defense Acquisition Board April 4, 2000 (Figure 2).

## Lessons Learned

A number of lessons learned emerged from our MEP planning efforts.

- We initially failed to effectively use local Defense Contract Management Agency offices by not making them more active members of the IPTs.
- Contractors had problems dealing with the new abbreviated processes, e.g., estimating vs. planning and pricing processes. The contractor did not have an approved Alpha contracting process that would allow certification of the contract price as fair and reasonable without going through the traditional proposal estimating process, even though it was not required by the government.
- Although all Overarching Integrated Product Team (OIPT) members were invited to participate in the IBR process, few were able to take advantage due to schedule and workload constraints. Those that did participate were primarily in a data-gathering mode rather than taking an active role in the internal decision-making process.
- The amount of time and effort required between the completion of the IBR and the Milestone Review was grossly underestimated. Pre-briefs and follow-up actions to address various issues constituted a full-time job.

## Major Payoff

Overall the Acquisition Reform Initiatives employed by Comanche during the Milestone II decision preparation were extremely successful. Establishing an EMD Contract Baseline, although preliminary, allowed an unprecedented understanding of the program and its associated risks. The major payoff from the process came from direct involvement by the "stakeholders" (user, developer, contractors) in making the critical cost, schedule, and performance trade-offs with sufficiently detailed information.

In essence, the whole EMD planning process was driven by Cost As an Independent Variable (CAIV) methodologies. The result of investing the time and effort in the early IBR was that the Army got the utmost out of the Comanche MEP for the resources available, while known risks and trade-offs were made in sufficient time to support the Milestone Decision process.

**Editor's Note:** For more information, visit the Comanche PMO Web site at **http://www.comanche.redstone.army.mil/logo_rah.html**.